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### Title

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### Permalink

<https://escholarship.org/uc/item/186290t9>

### Journal

Orthopedic reviews, 1(1)

### ISSN

2035-8237

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### Publication Date

2009-06-01

### DOI

10.4081/or.2009.e2

Peer reviewed

# Arthroscopic management of an intraarticular osteochondroma of the hip

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## Abstract

The role of hip arthroscopy in the management of femoroacetabular impingement (FAI) has been advancing rapidly. In this case report, we describe the use of hip arthroscopy to successfully treat a femoral neck osteochondroma that caused a symptomatic labral tear in a 37 year old woman. Hip arthroscopy offers several advantages to surgical dislocation of the hip in the management of intraarticular pathology and FAI. Hip arthroscopy is minimally invasive without the significant trauma to hip musculature, is useful in treatment of labral tears generated by FAI, and can be used to resect small lesions on the femoral head.

## Introduction

Osteochondromas are common lesions that are usually benign, cartilage capped tumors arising from the growth plates of long bones.<sup>1</sup> They can be solitary or can occur as a result of multiple hereditary exostoses (MHE), a dominantly inherited condition caused by a point mutation of the exostosin gene family.<sup>2,3</sup> Proximal femur and acetabular osteochondromas are relatively uncommon but have been reported in the literature.<sup>4,5</sup> Previous case reports have described progressive hip subluxation of a hip joint in children who suffered from MHE, successfully treated with arthrotomy of the hip and en bloc excision of the lesion.<sup>6</sup> We describe the use of hip arthroscopy to successfully remove a symptomatic isolated intraarticular proximal femur osteochondroma causing a labral tear.

## Case presentation

### History

A 37 year old female presented for evaluation of right hip pain and limited range of motion for the previous six months. She did not describe any specific traumatic event, although she mentioned that the discomfort in her hip was worse with extended activity. She

also stated that running or increased exercise made her hip discomfort worse. She had complaints of occasional catching and locking particularly when rising from a seated position and with rotational maneuvers around the hip joint.

Physical exam of the patient demonstrated a normal gait. Hip range of motion was decreased in flexion and internal rotation on the symptomatic hip compared to the asymptomatic hip. Flexion was from 0 to 110 degrees on the symptomatic side and up to 120 degrees on the asymptomatic side. Internal rotation at 90 degrees was limited to 15 degrees on the symptomatic side versus 25 degrees on the asymptomatic side. Hip extension and abduction was symmetric bilaterally. The patient noted pain with flexion and internal rotation of her hip, suggesting intraarticular pathology.

Standard anteroposterior and elongated neck radiographs did not clearly demonstrate significant osseous abnormalities. Multidetector helical CT scans were obtained through the right hip. 3-D volume rendered images were obtained. Evaluation of the right hip joint revealed the joint space to be maintained. There was a bony exostosis arising from the anterior aspect of the femoral neck measuring 0.9×0.8×1.3 cm which indented the posterior aspect of the iliofemoral ligament (Figure 1A). Magnetic resonance imaging (MRI) demonstrated nondisplaced anterior labral tear, which extended to the anterosuperior labrum (Figure 1B). Evaluation of the articular cartilage demonstrated mild thinning anteriorly on the acetabular side, with no high-grade cartilage defect. The location of the cartilage thinning and labral injury was adjacent to the location of the exostosis which appeared to engage the acetabulum with the end ranges of flexion and internal rotation. The anterior capsule was thickened in the area surrounding the osteochondroma (Figure 1C). The alpha angle was determined to be 49 degrees.

An intra-articular injection of lidocaine and marcaine was able to relieve her symptoms completely but transiently. Therefore, the decision was made to proceed with hip arthroscopy.

### Surgical procedure

The patient underwent right hip arthroscopy in the supine position. After traction was applied, a lateral portal was established using fluoroscopy. A second mid-lateral portal was established under direct vision. With the 70° arthroscope, a labral tear was identified in the anterosuperior aspect of the acetabulum (Figure 2). It was probed and felt not to be repairable. The labral tear was debrided with arthroscopic instrumentation to a stable rim (Figure 2A and B). The acetabular rim was noted to have significant overhang and was resected with the 4.0 mm burr.

Arthroscopy of the peripheral compartment

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Key words: hip arthroscopy, osteochondroma,  
femoroacetabular impingement, labral tear.

Received for publication: 4 February 2009

Accepted for publication: 27 March 2009

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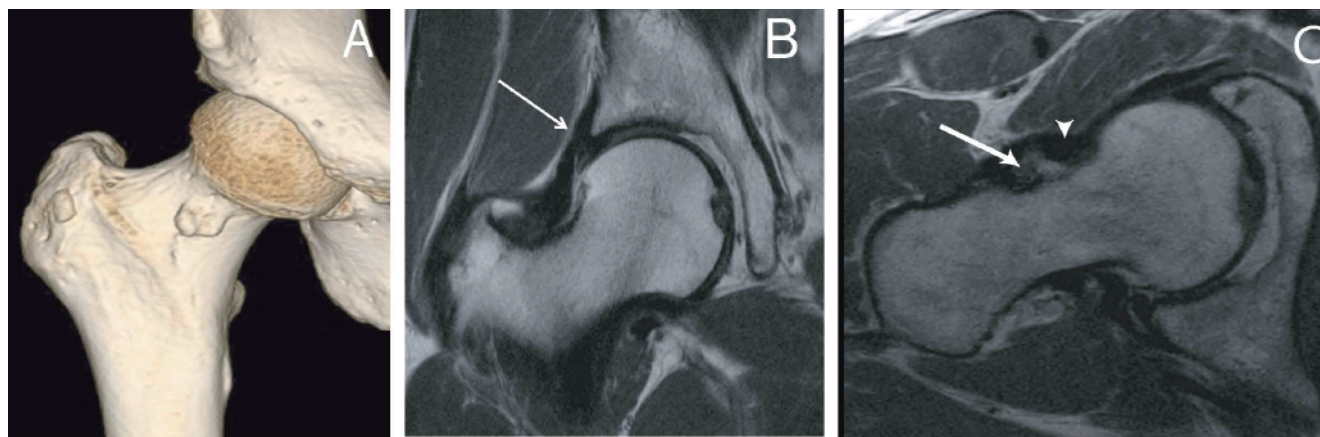
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Orthopedic Reviews 2009; 1:e2  
doi:10.4081/or.2009.e2

was performed with the hip out of traction. The osteochondroma was visualized on the antero-medial aspect of the femoral neck (Figure 2C). A pituitary rongeur was used to sample tissue for pathology. A 5.5 mm burr was then introduced through the second portal. Sequential removal of the osteochondroma was performed to recreate an anatomic femoral head and neck (Figure 2D). At the completion of the bone resection, all debris was removed from the peripheral compartment, and dynamic arthroscopy was performed to confirm the absence of any residual impingement.

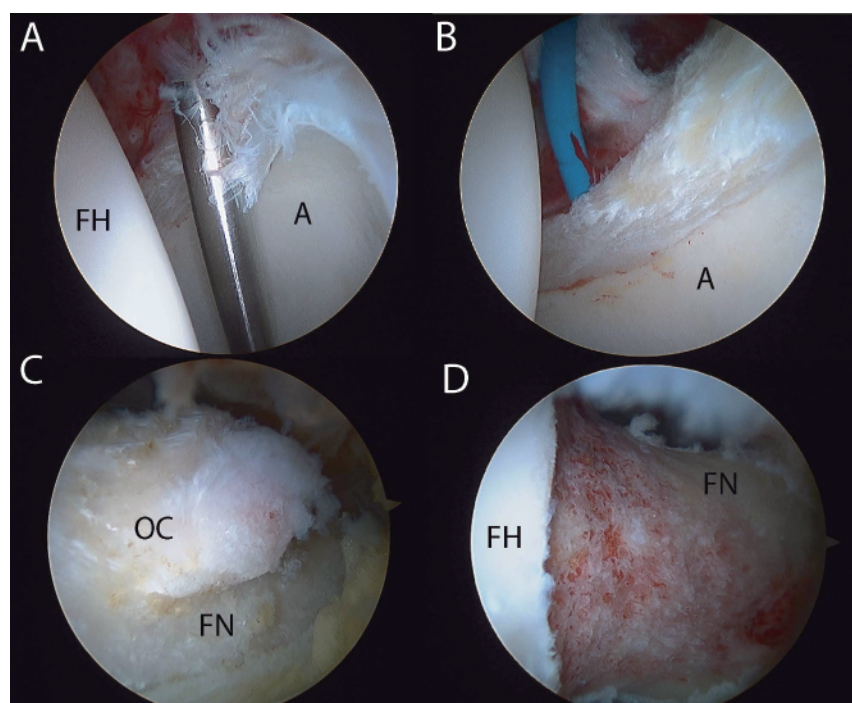
Postoperatively, the patient was placed in continuous passive motion daily for four weeks, with flexion of the hip from 0 to 120°. Weight bearing was restricted to a 20 pound foot flat weight bearing on the affected leg for four weeks. Her pain was significantly improved at the time of her most recent follow-up (six months), with no pain or catching with hip flexion. No complications were noted. Pathologic evaluation was performed and was consistent with a mature osteochondroma.

## Discussion

Hip involvement of osteochondromas and MHE is rare, and has only been described as case reports in the literature. Previous open surgical strategies have varied depending on the location of the osteochondromas. Woodward *et al.* described 2 cases of hip subluxation in MHE with osteochondromas located on the acetabulum. Treatment consisted of surgical dislocation of the hip, open excision of the osteochondroma and relocation of the femoral head.<sup>5</sup> Felix *et al.* described bilateral hip subluxation and femoroacetabular dysplasia in a patient with isolated proximal femur osteochondromas.<sup>4</sup> The patient was managed with bilateral femoral varus derotation



**Figure 1.** (A) 3D CT reconstruction of the right hip demonstrating the osteochondroma on the medial aspect of the femoral neck. (B) Coronal MRI of the hip demonstrates an anterosuperior labral tear that is nondisplaced (arrow). (C) Swiss axial MRI of the hip demonstrates the osteochondroma (arrow) with thickening of the anterior capsule (arrowhead) adjacent to the lesion.



**Figure 2.** (A) Arthroscopic view of the hip from the lateral portal demonstrating the femoral head (FH), acetabulum (A), and the labral tear on the anteromedial aspect of the labrum. (B) After debridement of the labral tear. (C) Arthroscopic view of the peripheral compartment with visualization of the osteochondroma (OC) on the femoral neck (FN). (D) After resection of the osteochondroma.

osteotomies and bilateral acetabular osteotomies to increase the coverage of the femoral heads. Ofiram and Porat recently described femoral and acetabular osteochondromas that were successfully treated with hip subluxation and excision of the lesions.<sup>6</sup>

To our knowledge, this is the first case report of an osteochondroma causing a labral tear of the acetabulum successfully treated with hip arthroscopy. In this case, there is significant evidence that the labral tear was caused by the osteochondroma. The location of the labral tear during hip arthroscopy was noted to be more medial than the typical anterosuperior area affected by a cam lesion. This area corresponds to the area of the osteo-

chondroma that would impact into the femoral neck with flexion. In addition, the alpha angle, traditionally increased in patients with abnormal cam lesions,<sup>7</sup> was normal in this patient.

Hip arthroscopy offers several advantages to surgical dislocation of the hip in the management of intraarticular pathology and FAI. Hip arthroscopy is minimally invasive without the significant trauma to the hip musculature, is useful in the treatment of labral tears generated by FAI, and can be used to resect cam lesions on the femoral head. Sussmann *et al.* demonstrated in a cadaveric model that there were no differences between open and arthroscopic techniques regarding volume, depth, or overall arc of resection of the cam lesion.<sup>8</sup> The

authors concluded that arthroscopic decompression of the head-neck junction for isolated cam-type impingement can be performed with accuracy that approaches the open surgical technique.

The treatment of acetabular labral tears by arthroscopic techniques has been recently reviewed in multiple studies and has been found to have good overall results. In the study with the largest patient group to date, Santori and Villar reported a 67% satisfaction rate after labral debridement in 58 patients with 3.5 year follow-up.<sup>9</sup> Robertson *et al.* recently performed a systematic review of arthroscopic management of labral tears in the hip and concluded that patients can expect approximately a 67%

satisfaction rate 3.5 years after surgery and a complete resolution of mechanical symptoms in over 50% of the patients.<sup>10</sup>

In summary, we present a case report of an intraarticular hip osteochondroma as a novel cause for a labral tear. This can be successfully managed with hip arthroscopy, which allows the surgeon to evaluate and resect the osteochondroma itself, as well as address any pathology on the acetabular side of the joint in a minimally invasive manner.

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